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(54) Linear power control for ultrasonic probe with tuned reactance.

(57) There is disclosed herein a driver system for an ultrasonic probe for allowing a user to have proportional control of the power dissipated in the probe in accordance with the position of power dissipation controls operable by the user. The system uses a tunable inductor in series with the piezoelectric crystal excitation transducer in the probe which has a flux modulation coil. The bias current through this flux modulation coil is controlled by the system. It is controlled such that the inductance of the tunable inductor cancels out the capacitive reactance of the load impedance presented by the probe when the probe is being driven by a driving signal which matches the mechanical resonance frequency of the probe. The resulting overall load impedance is substantially purely resistive. The system measures the phase angle and monitors the power level. The system uses this information to adjust the bias current flowing through the flux modulation coil to maintain the substantially purely resistive load impedance for changing power levels. This information is also used to adjust the frequency of the driving signal to track changing mechanical resonance conditions for the probe at different power levels. This method of operation insures substantially maximum power transfer efficiency and substantially linear power control over a range of power dissipation levels.

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EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	US-A-4 551 690 (QUIST) * Abstract; figure 1 * ---	1	B 06 B 1/06
A	GB-A-1 130 442 (UNION SPECIAL MACHINE CO.) * Page 2, lines 44-63 * ---	2	
A	US-A-4 525 790 (NAKAMURA) * Abstract * ---	2	
A	US-A-3 432 691 (SHOH) * Column 5, line 74 - column 6, line 4; figure 7 * -----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

G 10 K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	11-10-1988	ANDERSON A.TH.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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